

VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor, municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from the operation of a privately owned package sewage treatment plant which serves a residential educational facility with 50 students and 20 staff members. This permit action consists of updating the permit to reflect change in the facility address, changes in Water Quality Standards, Guidance Memos, and the VPDES Permit Manual.

SIC Code: 8361 Residential Care
4952 Sewerage Systems

1. Facility Name and Address: Elk Hill Farm WWTP
1975 Elk Hill Rd.
Goochland, VA 23063
Contact: Robert Browning, Maintenance Supervisor
Telephone No: (804) 457-4866
2. Permit No. VA0062731 Expiration Date: November 4, 2008
3. Owner Name and Address: Elk Hill Farm, Inc.
P.O. Box 99
Goochland, Virginia 23063
[Executive Director: Michael Farley, (804) 457-4866]
Contact: Michael L. Cook, Operations Consultant
P.O. Box 13
Doswell, VA 23047
Telephone No: (804) 994-2088
4. Application Complete Date: February 10, 2009
(Administratively Complete: September 23, 2008)
Permit Drafted By: Tamira Cohen Date: December 5, 2008
Reviewed By: Denise Mosca Date: December 11, 2008
Reviewed By: C. Linderman Date: February 1, 2009
DEQ Regional Office: Piedmont Regional Office
5. Receiving Stream Name: Unnamed Tributary of Little River
River Mile: 2-XVZ000.06
Basin: James River (Middle)
Subbasin: N/A
Section: 10
Class: III
Special Standards: None

7-Day, 10-Year Low Flow (7Q10): 0 MGD 7-Day, 10-Year High Flow (7Q10): 0 MGD
1-Day, 10-Year Low Flow (1Q10): 0 MGD 1-Day, 10-Year High Flow (1Q10): 0 MGD
30-Day, 10-Year Low Flow (30Q10): 0 MGD 30-Day, 10-Year High Flow (30Q10): 0 MGD
30-Day, 5-Year Low Flow (30Q5): 0 MGD Harmonic Mean Flow (HM): 0 MGD
Tidal? NO 303(d) list? NO

See **Attachment A** – Flow Frequency Determination Memorandum

6. Operator License Requirements: The recommended attendance hours by a licensed operator and the minimum daily hours that the treatment works should be manned by operating staff are contained in the Sewage Collection and Treatment Regulations (SCATS) 9 VAC 25-790 et seq. A Class IV licensed operator is required for this facility.
7. Reliability Class: Reliability is a measurement of the ability of a component or system to perform its designated function without failure or interruption of service. The reliability classification is based on the water quality and public health consequences of a component or system failure. The permittee is required to maintain Class II Reliability for this facility.
8. Permit Characterization:
- | | |
|---|--|
| <input type="checkbox"/> Issuance | <input checked="" type="checkbox"/> Existing Discharge |
| <input checked="" type="checkbox"/> Reissuance | <input type="checkbox"/> Proposed Discharge |
| <input type="checkbox"/> Revoke & Reissue | <input checked="" type="checkbox"/> Effluent Limited |
| <input type="checkbox"/> Owner Modification | <input checked="" type="checkbox"/> Water Quality Limited |
| <input type="checkbox"/> Board Modification | <input type="checkbox"/> WET Limit |
| <input type="checkbox"/> Change of Ownership/Name | <input type="checkbox"/> Interim Limits in Permit |
| Effective Date: | <input type="checkbox"/> Interim Limits in Other Document (attached) |
| <input checked="" type="checkbox"/> Municipal | <input type="checkbox"/> Compliance Schedule Required |
| SIC Code(s): 4952, 8361 | <input type="checkbox"/> Site Specific WQ Criteria |
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Variance to WQ Standards |
| SIC Code(s): | <input type="checkbox"/> Water Effects Ratio |
| <input type="checkbox"/> POTW | <input type="checkbox"/> Discharge to 303(d) Listed Segment |
| <input checked="" type="checkbox"/> PVOTW | <input type="checkbox"/> Whole Effluent Toxicity Program Required |
| <input checked="" type="checkbox"/> Private | <input type="checkbox"/> Toxics Reduction Evaluation |
| <input type="checkbox"/> Federal | <input type="checkbox"/> Possible Interstate Effect |
| <input type="checkbox"/> State | <input type="checkbox"/> Storm Water Management Plan |
9. Wastewater Flow and Treatment:

Outfall Number	Wastewater Source	Treatment	Design Flow (MGD)
001	Domestic wastewater generated by the building tenant.	Activated sludge treatment package plant (extended aeration mode) with chlorine disinfection, dechlorination, and post aeration.	0.0125

See **Attachment B** – Wastewater Treatment Plant Schematic

10. Sewage Sludge Use or Disposal: The facility will pump and haul sludge to an authorized receiving facility. A revised Sludge Management Plan (VPDES Sewage Sludge Permit Application Form) is being required within 120 days of permit reissuance in order to provide the final details of the sludge disposal practice (primarily the authorized receiving facility).
11. Discharge Location Description: See **Attachment C** – Location Map (USGS Cartersville, VA).
12. Material Storage: Chlorination and dechlorination tablets are stored under roof.
13. Ambient Water Quality Information: A DEQ ambient water quality monitoring station is not located on the receiving stream. Stream flows are intermittent with no measurable flow expected under

design conditions. Therefore, effluent data is used to characterize the stream water quality. See **Attachment A** for the Flow Frequency Determination provided by Jennifer V. Palmore, DEQ PRO Senior Environmental Planner.

14. Antidegradation Review & Comments:

Tier: 1 X 2 3

The State Water Control Board's Water Quality Standards include an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. Due to its intermittent nature, the receiving stream (unnamed tributary of Little River) is determined to be a Tier 1 waterbody as indicated by Jennifer V. Palmore, DEQ Senior Planner, in the Flow Frequency Determination Memorandum (**Attachment A**). This determination is based on the intermittent nature of the stream where beneficial uses cannot be fully attained.

15. Site Inspection: Date October 7, 2008 Performed by Mike Dare, Tamira Cohen
See **Attachment D** for Inspection Report.

16. Effluent Screening & Limitation Development:

PARAMETER	BASIS	DISCHARGE LIMITS				Monitoring Requirements	
		MO AVG	WK AVG	MIN	MAX	FREQ	SAMPLE TYPE
001 Flow	NA	NL	NA	NA	NL	1/Day	Estimate
002 pH	1,2	NA	NA	6.0 s.u.	9.0 s.u.	1/Day	Grab
003 5-Day Biological Oxygen Demand (BOD ₅)	2	30 mg/L 1400 g/day	45 mg/L 2100 g/day	NA	NA	1/Month	Grab
004 Total Suspended Solids (TSS)	2	30 mg/L 1400 g/day	45 mg/L 2100 g/day	NA	NA	1/Month	Grab
005 Total Residual Chlorine (TRC)	1	0.0080 mg/L	0.0098 mg/L	NA	NA	1/Day	Grab
007 Dissolved Oxygen (DO)	3	NA	NA	5.5 mg/L	NA	1/Day	Grab
039 Ammonia-N (NH ₃ -N)	1	2.2 mg/L	2.2 mg/L	NA	NA	1/Month	Grab
120 <i>E. coli</i>	1	126 N/100 mL (geometric mean)	NA	NA	NL	2/Month	Grab (10am-4pm)
157 TRC**	3	NA	NA	1.0 mg/L	NA	1/Day	Grab
213 TRC**	3	NA	NA	0.60 mg/L	NA		

1. Water Quality Based Effluent Limitations
2. Federal Effluent Limit Guidelines
3. Best Engineering Judgment

**157 and 213 TRC samples are taken prior to dechlorination (they are not final effluent).

See **Attachment E** for Facility Effluent Data Summary and Evaluation, **Attachment F** for MSTRANTI Printout and MSTRANTI Data Source Report, **Attachment G** for the 2003 permit reissuance Ammonia limit development and **Attachment H** for Stream Sanitation Analysis.

pH: A pH limitation of 6.0-9.0 Standard Units is assigned to all Class III waters in accordance with VA Water Quality Standards, 9VAC 25-260-50 and federal effluent limit guidelines for secondary treatment (40 CFR 133.102).

BOD₅/TSS: The BOD₅/TSS monthly average limitations of 30 mg/L (1,400 g/day) and weekly average limitations of 45 mg/L (2,100 g/day) are carried forward from the 2003 permit reissuance. These limits are in accordance with federal effluent limit guidelines for secondary treatment (40 CFR 133.102).

For Ammonia (NH₃) and Total Residual Chloride (TRC), limitation evaluation begins with a wasteload allocation analysis using MSTRANTI draft k, version 1 (a DEQ excel spreadsheet). Acute and chronic waste load allocations are calculated from criteria for surface water given in the VA Water Quality Standards (9VAC 25-260-140). Statistically derived permit limits are then obtained by inputting these acute and chronic waste load allocations along with default data values (see below) and required quantification limits into the DEQ statistical program.

(STATS.exe). Since the discharge is to an intermittent stream, effluent data is used to characterize the stream during low flow conditions.

TRC: TRC monthly (0.0080 mg/L) and weekly average (0.0098 mg/L) limitations are carried forward from the 2003 permit reissuance. The wasteload allocation analysis was conducted as described above. A TRC default data value of 20.0 mg/L is used to force the calculation of a limit where chlorination is the means of disinfection. Since chlorine is a known toxicant and purposefully introduced into the effluent, a chlorine limit is required.

NH₃: The NH₃ monthly/weekly average limitations of 2.2 mg/L are carried forward from the 2003 permit (See **Attachment G**). The wasteload allocation analysis was conducted as described above with the exception that an ammonia default data value of 9.0 mg/L was used in place of effluent data in accordance with DEQ Guidance Memo No. 00-2011. Ammonia is known to be present in domestic effluents and thus a reasonable potential exists for any domestic facility to cause or contribute to a violation of the VA Water Quality Standards. This default value is the expected number resulting from the analysis of a large body of ammonia concentration data in domestic effluents. The current analysis shows that the NH₃ monthly and weekly average effluent limitations may both increase to 3.7 mg/L, however, the previous monthly and weekly average limitations are carried forward to this reissuance as stated above in order to avoid antibacksliding violations. The facility has been in compliance with the existing NH₃ limitations.

DO: The DO minimum limitation of 5.5 mg/L is carried forward from the 2003 permit reissuance. This limitation is in accordance with recommendations made in the 1977 Stream Sanitation Analysis (See **Attachment H**). The facility has been in compliance with the existing DO limitation.

***E. coli*:** Water Quality Based Effluent Limitation. All sewage discharges must be disinfected to achieve applicable bacterial concentrations in accordance with VA Water Quality Standards, 9VAC 25-260-170. *E. coli* is the bacterial indicator for sewage effluents to freshwater. See Items #24 and #25 below for additional comments.

TRC (157 and 213): Limits are carried forward from the 2003 permit (in current permit reissuance special condition Part I.B.). See Item #20.B. for special condition rationale.

17. Basis for Sludge Use & Disposal Requirements: Not applicable as this facility pumps and hauls sludge off-site. See Item #10 above.
18. Antibacksliding Statement: All limits are at least as stringent as in the previous permit.
19. Compliance Schedules: No compliance schedules are in effect, or required for this facility.
20. Special Conditions:

B. Additional Chlorine Limitations and Monitoring Requirements

Rationale: Required by VA Water Quality Standards, 9 VAC 25-260-170 Bacteria: other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.

C.1. 95% Capacity Reopener

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B4 for all POTW and PVOTW permits.

C.2. **CTC & CTO Requirement**

Rationale:

Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulation, 9 VAC 25-790-50.

C.3. **O&M Manual Requirement**

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulation, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.

C.4. **Licensed Operator Requirement**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), requires licensure of operators.

C.5. **Reliability Class**

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790-70 for all municipal facilities.

C.6. **Materials Handling/Storage**

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia § 62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

C.7. **Sludge Reopener**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage.

C.8. **Sludge Use and Disposal**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. A revised Sludge Management Plan (VPDES Sewage Sludge Permit Application Form) is being required within 120 days of permit reissuance in order to provide the final details of the sludge disposal practice.

C.9. **Compliance Reporting**

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

C.10. **Total Maximum Daily Load (TMDL) Reopener**

Rationale: Section 303(d) of the Clean Water Act requires that TMDLs be developed for waters listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving waters. This reopener is being put into all permits even if the discharge is not to a listed segment. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

C.11 Facility Closure Plan

Rationale: Code of Virginia § 62.1-44.18:3 of the State Water Control Law establishes the requirement to submit and implement a closure plan for a private wastewater treatment facility if the treatment facility ceases operations. Sewage collection and treatment regulations 9 VAC 25-790 establishes the requirement for all treatment works to submit and implement a closure plan if the treatment facility undergoes new construction or substantial modification.

Part II Conditions Applicable to All Permits

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. Changes to Permit

Changes to Cover Page	
Changes	Reason
Format	Wording updated to reflect current agency guidance.
Facility Location	Updated as per application.

Changes to Part I.A.1 Outfall 001					
Parameter	Effluent Limits		Monitoring Requirements		Reason
	From	To	From	To	
TSS/BOD ₅ MO AVG	1.4 kg/d	1400 g/d	NC	NC	Loading units changed and limits rewritten to report whole numbers and reflect two significant figures in accordance with DEQ Guidance Memo 06-2016.
TSS/BOD ₅ WK AVG	2.1 kg/d	2100 g/d			
<i>E. coli</i> MO AVG	NR	126 N/100 mL geometric mean	NR	2/Mos	Added in accordance with current agency guidance. See Items #24 and #25 below.
NC = No Change NL = Monitor Only NR = Not required					

Other Changes to Part I.A.1 Outfall 001
<p>Footnotes for Part I.A.1. (Outfall 001) of the draft permit were inserted to reflect new format and revisions as indicated below:</p> <p>Part I.A.1.a. of the 2003 permit reissuance was changed to Part I.A.1. footnote (a) and revised with an additional sentence pertaining to flow requirements.</p> <p>Part I.A.1.b. of the 2003 permit reissuance was changed to Part I.A.1. footnote (c). Language was modified for clarification.</p> <p>Part I.A.1.c. of the 2003 permit reissuance was removed as no compliance schedules are in effect for the current reissuance.</p> <p>Footnote (b) and (d) were added to the current permit reissuance in accordance with current agency guidance.</p> <p>Part I.A.3. in the 2003 permit reissuance was moved to Part I.A.4.</p> <p>Part I.A.3. was added to the current permit reissuance in accordance with current agency guidance.</p>

Special Condition Changes		
From	To	Rationale
B.1.	B	Additional Chlorine Limitations and Monitoring Requirements—Language and format was revised. TRC (DMR parameter 213) was changed from 0.6 to 0.60 mg/L to reflect increase to two significant figures in accordance with DEQ Guidance Memo 06-2016.
B.2.	--	Bacterial Effluent Limitations and Monitoring Requirements – Additional Instructions (Chlorine/ <i>E. coli</i> Surrogate Study)—Removed since the facility was able to adequately satisfy this requirement and since chlorine demonstration studies are no longer required in VPDES permits in accordance with current agency guidance (documented in the minutes of the Water Permits Manager Conference Call on February 4, 2004). It should be noted that an <i>E. coli</i> limit is being required in the current permit reissuance due to requirements of the James River bacteria TMDL which supercedes those of the demonstration study results.
C.	--	Compliance Schedule—Removed as this requirement was satisfied and no compliance schedules are included in the current permit reissuance.
D.1.	C.1.	95% Capacity Reopener—No change.
D.2.	C.3.	O&M Manual—Reflects changes in VPDES Permit Manual guidance.
D.3.	C.6.	Materials Handling/Storage—No change.
D.4.	C.5.	Reliability class—No change.
D.5.	C.4.	Licensed operator requirement— No change.
D.6.	C.7.	Sludge Reopener— No change.
D.7.	C.8.	Sludge Use and Disposal—Reflects changes in VPDES Permit Manual guidance, transfer of program from VDH to DEQ, and addition of requirement for revised SMP within 120 days of permit reissuance. See Items #10, and #20.C.8.
D.8.	C.11.	Facility Closure plan—Revised in order to update requirements under the Sewage Collection and Treatment regulations (for new construction or substantial modification) and include requirement for permanent closure. See Item #20. C.11.
D.9.	C.9.	Compliance Reporting—Revised in accordance with current VPDES Permit Manual guidance. Language revised to improve clarity in accordance with PRO Staff decision on May 6, 2008.
--	C.2.	CTC, CTO Requirement—Added in accordance with current VPDES Permit Manual guidance.
--	C.10.	Total Maximum Daily Load (TMDL) Reopener—Added in accordance with current VPDES Permit Manual guidance.

22. Variances/Alternate Limits or Conditions: None.

23. Public Notice Information required by 9 VAC 25-31-280 B:

Publication Dates: March 12, 2009 and March 19, 2009

Comment period Start Date: March 12, 2009 End Date: April 13, 2009

Publication in: Goochland Gazette

All pertinent information is on file and may be inspected, and copied by contacting Tamira Cohen at:

VDEQ - Piedmont Regional Office
4949-A Cox Road
Glen Allen, VA 23060
Telephone No. (804) 527-5012
E-mail address: tcohen@deq.virginia.gov

DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief,

informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment

Public Comment: None.

24. Additional Comments:

Previous Board Action: None.

Staff Comments:

- a. The Financial Assurance Regulation (9 VAC 25-650) does not apply to this facility. The facility was not listed in Appendix B of GM 01-2002 as subject to 9VAC 25-650. Additionally, if the permittee abandoned the facility, the school and the WWTP would close. Flow to the treatment plant would cease and consequently the need for DEQ to ensure a temporary continuation of services through financial assurance would not be required.
- b. There are no special standards required for the receiving stream (UT to Little River which drains to the Middle James River Basin). While the special standard NEW-3 is listed for Class III waters within this section of the James River and its tributaries in the VA WQS, it only applies to the South Fork Rivanna Reservoir and its tributaries (primarily Albemarle County). The receiving stream is within Goochland County and does not discharge to the South Fork Rivanna Reservoir or its tributaries.
- c. This facility does not qualify for reduced monitoring as enforcement action has been initiated in relation to the late submittal of application materials beyond permit expiration. Although the permittee had sufficient time to sample and report results for fecal coliform as required, the first sample was taken on September 25, 2008. Due to the minimum requirement of a four month period between at least two of the samples, the final sample could be taken on or after January 25, 2009. The final fecal result was received February 10, 2009.
- d. The facility is not subject to the requirements of the Chesapeake Bay Nutrient General Permit as the facility's design flow is less than 40,000 gpd, the discharge is upstream of the fall line, and no expansion is underway at this time.
- e. An *E. coli* effluent limitation (monthly average of 126 N/100 mL) was added to Outfall 001 in accordance with current agency guidance as addressed in the January 24, 2008 letter from John Capacasa, EPA Region III Director, Water Protection Division to Ellen Gilinsky, DEQ Director, Division of Water Quality Programs and in the minutes of the January 22, 2008 Water Permits Managers' Conference Call.
- f. The permit was not reissued prior to expiration (current permit expired on November 4, 2008) since there were delays in obtaining all required application submittals. The application was deemed complete on February 10, 2009. DEQ is authorized to "administratively continue" the conditions of an expired permit until the issuance of a new permit if the conditions

established in 9 VAC 25-31-70.A and B are met. As this facility met both of these conditions, the permit was administratively continued.

- g. The Virginia Department of Health's Office of Drinking Water reviewed the reissuance application and responded with comments on September 29, 2008 identifying the raw water intake for the James River Correctional Center WTP located on the James River 25.9 miles downstream of the facility discharge and just upstream of its confluence with Beaverdam Creek. VDH did not object to the permit but requested review of the draft permit. A copy of the draft permit was forwarded to VDH for review on February 12, 2009. VDH responded on February 17, 2009 and did not object to the permit.

25. 303(d) Listed Segments (TMDL):

The receiving stream was not assessed during the 2008 305(b)/303(d) Water Quality Assessment cycle, therefore the waters are considered Category 3A. Although the receiving stream is not impaired for the Recreation Use, the facility discharge received a wasteload allocation in the TMDL report for the James River and Tributaries – Lower Piedmont Region (approved by EPA on June 11, 2008). The wasteload allocation for the facility is 2.17×10^6 *E. coli* cfu/year, and was based on the facility design flow of 0.0125 MGD (see **Attachment A**). The 2009 permit reissuance has a limit of 126 N/100 mL for *E. coli* which is in compliance with the TMDL.

26. Attachments:

- A: Flow Frequency Determination Memorandum
- B: Wastewater Treatment Plant Schematic
- C: Location Map
- D: Inspection Report
- E: Facility Effluent Data Summary and Evaluation
- F: MSTRANTI Printout and MSTRANTI Data Source Report
- G: Excerpt from 2003 Permit Reissuance Fact Sheet (Ammonia Limit Development)
- H: Stream Sanitation Analysis

Attachment A

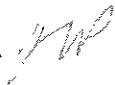
Flow Frequency Determination Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Elk Hill Farm WWTP - VA0062731

TO: Tamira Colien

FROM: Jennifer Palmore, P.G. 

DATE: September 18, 2008

COPIES: File

The Elk Hill Farm's wastewater treatment plant discharges to an unnamed tributary of the Little River near Elk Hill in Goochland County, VA. The discharge is located at river mile 2-XVZ000.06. Stream flow frequencies are required at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

At the discharge point, the receiving stream is shown to be an intermittent stream, as shown on the USGS Cartersville Quadrangle topographic map. The flow frequencies for intermittent streams are shown below.

Unnamed tributary at discharge point:

1Q30 = 0.0 cfs	High Flow 1Q10 = 0.0 cfs
1Q10 = 0.0 cfs	High Flow 7Q10 = 0.0 cfs
7Q10 = 0.0 cfs	High Flow 30Q10 = 0.0 cfs
30Q10 = 0.0 cfs	HM = 0.0 cfs
30Q5 = 0.0 cfs	

Due to its intermittent nature, the tributary is considered a Tier 1 water. It is appropriate to use effluent data, rather than ambient stream data, when calculating permit limits.

The receiving stream was not assessed during the 2006 or draft 2008 305(b)/303(d) Water Quality Assessment cycles, therefore the waters are considered Category 3A. However, although the stream is not impaired for the Recreation Use, the facility received a wasteload allocation in the TMDL report for the James River and Tributaries – Lower Piedmont Region. The wasteload allocation for Elk Hill Farm WWTP is 2.17E+10 E. coli cfu/year, which was based on a design flow of 0.0125 MGD.

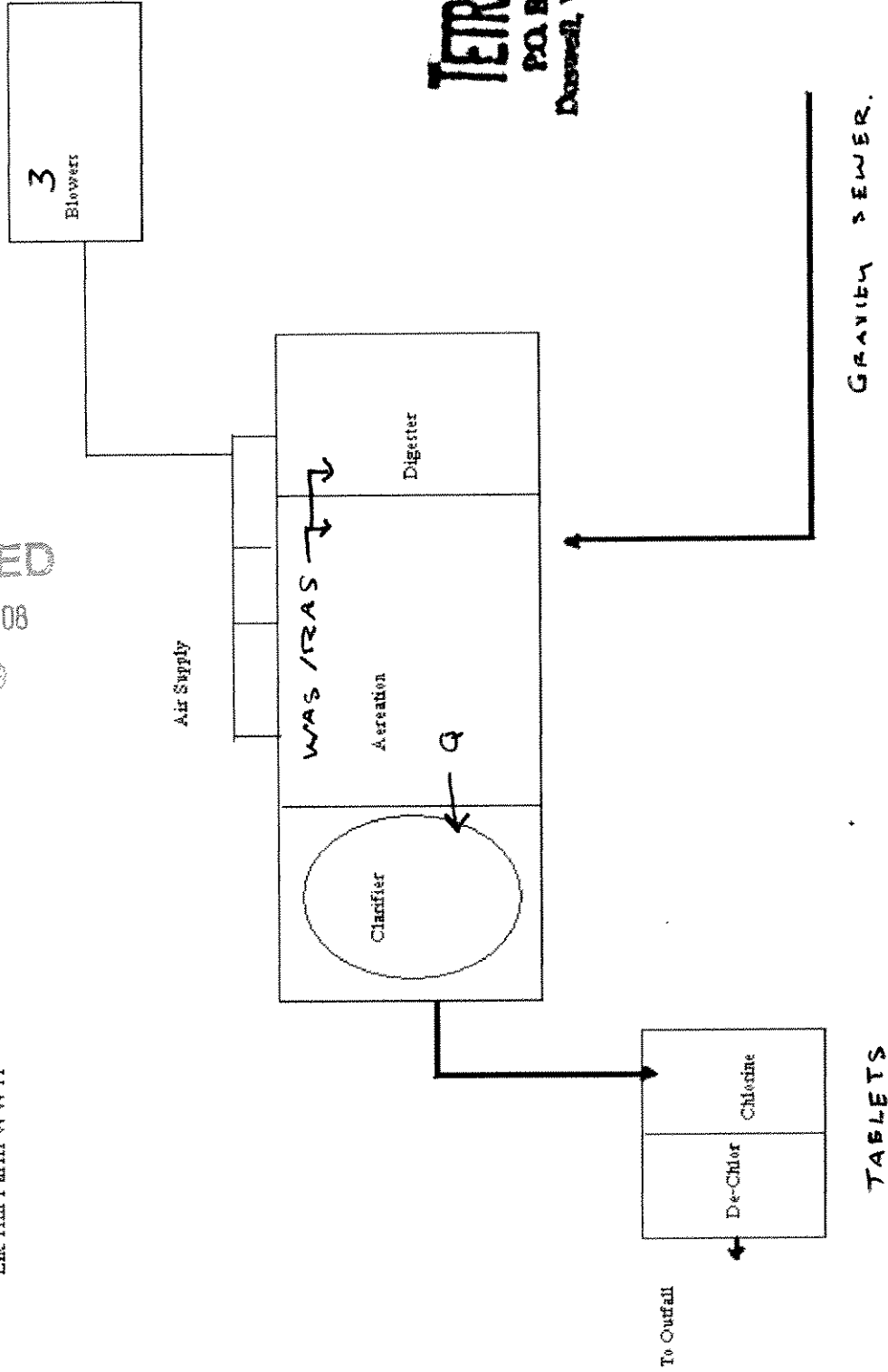
If you have any questions concerning this analysis, please let me know.

Attachment B

Wastewater Treatment Plant Schematic

T. Cohen
RECEIVED
MAY 28 2008
PRO

Elk Hill Farm WWTP



TETRAOPS
P.O. Box 13
Dorwell, VA 23047

Attachment C

Location Map

[Send To Printer](#)

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[Change to 11x17 Print Size](#)

[Show Grid Lines](#)

[Change to Landscape](#)

USGS 485 km SW of New York, New York, United States 01 Jul 1977

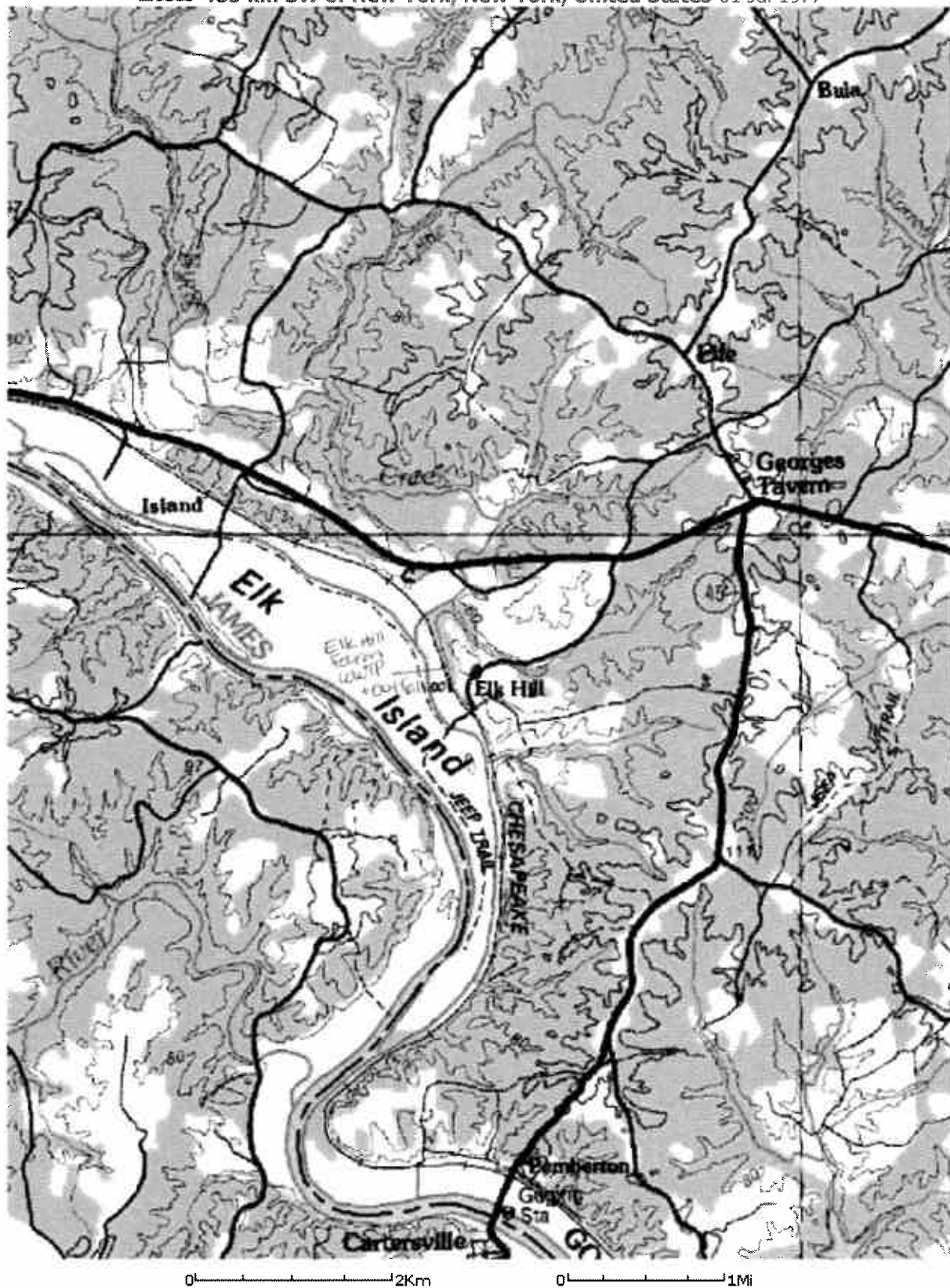


Image courtesy of the U.S. Geological Survey

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Attachment D

Inspection Report

Virginia Department of Environmental Quality

FOCUSED CEI TECH/LAB INSPECTION REPORT

FACILITY NAME: Elk Hill Farm WWTP		INSPECTION DATE: October 7, 2008 INSPECTOR: Mike Dare	
PERMIT No.: VA0062731		REPORT DATE: October 14, 2008	
TYPE OF FACILITY: <input checked="" type="checkbox"/> Municipal <input type="checkbox"/> Major <input type="checkbox"/> Industrial <input type="checkbox"/> Minor <input type="checkbox"/> Federal <input checked="" type="checkbox"/> Small Minor <input type="checkbox"/> HP <input type="checkbox"/> LP		TIME OF INSPECTION:	Arrival 1000 hrs. Departure 1300 hrs.
		TOTAL TIME SPENT (including prep & travel)	<u>10 hours</u>
PHOTOGRAPHS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		UNANNOUNCED INSPECTION? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
REVIEWED BY / Date:			
PRESENT DURING INSPECTION: Michael Cook, Tamira Cohen (DEQ)			

TECHNICAL INSPECTION

1. Has there been any new construction? • If so, were plans and specifications approved? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Is the Operations and Maintenance Manual approved and up-to-date? <u>Comments: Previous inspection report indicates DEQ approval; O&M Manual reportedly located at Farm maintenance office.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator being met? <u>Comments: Michael Cook is a Class I Operator</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? <u>Comments: Staffing maintained by Mr. Cook and Farm maintenance personnel</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Is there an established and adequate program for training personnel? <u>Comments: Training of Operators is by Michael Cook</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. Are preventive maintenance task schedules being met? <u>Comments: Routine equipment maintenance performed by Farm maintenance personnel</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Does the plant experience any organic or hydraulic overloading? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8. Have there been any bypassing or overflows since the last inspection? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? <u>Comments: N/A; there is no standby generator</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Is the plant alarm system operational and tested regularly? <u>Comments: N/A; there is no alarm system</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

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TECHNICAL INSPECTION

11. Is sludge disposed of in accordance with the approved sludge management plan? <u>Comments: Sludge is removed from the sludge holding tank as needed by a septage hauler ("Mo Johns"). For permit renewal purposes, Ms. Cohen requested that Mr. Cook provide additional information regarding the disposal location of the sludge along with any required County approval notices.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12. Is septage received? • If so, is septage loading controlled, and are appropriate records maintained? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13. Are all plant records (operational logs, equipment maintenance, industrial waste contributors, sampling and testing) available for review and are records adequate? <u>Comments: Equipment maintenance reportedly performed and records maintained by Farm maintenance personnel.</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14. Which of the following records does the plant maintain? <input checked="" type="checkbox"/> Operational logs <input checked="" type="checkbox"/> Instrument maintenance & calibration <input type="checkbox"/> Mechanical equipment maintenance <input type="checkbox"/> Industrial Waste Contribution (Municipal facilities) <u>Comments:</u>	
15. What does the operational log contain? <input checked="" type="checkbox"/> Visual observations <input type="checkbox"/> Flow Measurement <input checked="" type="checkbox"/> Laboratory results <input type="checkbox"/> Process adjustments <input type="checkbox"/> Control calculations <input type="checkbox"/> Other (specify) _____ <u>Comments: Currently, operational information is indicated on daily forms. Recommend that a dedicated log be kept on site for the recording of this information.</u>	
16. What do the mechanical equipment records contain? <input type="checkbox"/> As built plans and specs <input checked="" type="checkbox"/> Manufacturers instructions <input checked="" type="checkbox"/> Lubrication schedules <input type="checkbox"/> Spare parts inventory <input type="checkbox"/> Equipment/parts suppliers <input type="checkbox"/> Other (specify) _____ <u>Comments: Equipment maintenance reportedly performed and records maintained by Farm maintenance personnel.</u>	
17. What do the industrial waste contribution records contain (Municipal only)? <input type="checkbox"/> Waste characteristics <input type="checkbox"/> Impact on plant <input type="checkbox"/> Locations and discharge types <input type="checkbox"/> Other (specify) _____ <u>Comments: N/A; no industrial contributors</u>	
18. Which of the following records are kept at the plant and available to personnel? <input type="checkbox"/> Equipment maintenance records <input checked="" type="checkbox"/> Operational log <input type="checkbox"/> Industrial contributor records <input checked="" type="checkbox"/> Instrumentation records <input checked="" type="checkbox"/> Sampling and testing records <u>Comments:</u>	
19. List records not normally available to plant personnel and their location: <u>Comments: N/A</u>	
20. Are the records maintained for the required time period (three or five years)? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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UNIT PROCESS EVALUATION SUMMARY SHEET

UNIT PROCESS	APPLICABLE	PROBLEMS*	COMMENTS
Sewage Pumping	N/A		Collection system and WWTP flow is entirely by gravity
Flow Measurement (Influent)	N/A		
Screening/Comminution	Yes	None	Course bar screen at influent pipe; cleaned as required
Grit Removal	N/A		
Oil/Water Separator	N/A		
Flow Equalization	N/A		
Ponds/Lagoons	N/A		
Imhoff Tank	N/A		
Primary Sedimentation	N/A		
Trickling Filter	N/A		
Septic Tank and Sand Filter	N/A		
Rotating Biological Contactor	N/A		
Activated Sludge Aeration	Yes	None	Medium brown color; 30 min settling 340 ml/l – 10/7/08
Biological Nutrient Removal	N/A		
Sequencing Batch Reactor	N/A		
Secondary Sedimentation	Yes	None	Effluent slightly turbid
Flocculation	N/A		
Tertiary Sedimentation	N/A		
Filtration	N/A		
Micro-Screening	N/A		
Activated Carbon Adsorption	N/A		
Chlorination	Yes	1,3	Only 1 tube in use; “bridging” noted; 0 Cl2 result
Dechlorination	Yes	1,3	2 tubes in use)
Ozonation	N/A		
Ultraviolet Disinfection	N/A		
Post Aeration	Yes	None	Tied into blower system
Flow Measurement (Effluent)	Yes	None	Estimated – based on well totalizer
Land Application (Effluent)	N/A		
Plant Outfall	Yes	1	Could not access; need to clear path to location
Sludge Pumping	Yes	1,3	Low RAS flow; Mr. Cook reported air lift system blocked
Flotation Thickening (DAF)	N/A		
Gravity Thickening	N/A		
Aerobic Digestion (sludge holding tank)	Yes	None	Portable sump pump used for decanting purposes
Anaerobic Digestion	N/A		
Lime Stabilization	N/A		
Centrifugation	N/A		
Sludge Press	N/A		
Vacuum Filtration	N/A		
Drying Beds	N/A		
Thermal Treatment	N/A		
Incineration	N/A		
Composting	N/A		
Land Application (Sludge)	N/A		

* Problem Codes

- | | |
|----------------------------------|--|
| 1. Unit Needs Attention | 4. Unapproved Modification or Temporary Repair |
| 2. Abnormal Influent/Effluent | 5. Evidence of Process Upset |
| 3. Evidence of Equipment Failure | 6. Other (explain in comments) |

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INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

Bar Screen: Course bar screen located at the influent pipe. Cleaned as required.

Aeration Basin: Aerated by three blowers (two on-line, one backup). Basin is aerated every other half hour. Activated sludge was medium brown with slight musty odor. Basin was well mixed by diffusers. The 30-minute settling performed at the time of inspection was 340 ml/l.

Clarifier: Auto surface skimmer was performing very well. There was very little RAS being pumped back to the aeration basin. Mr. Cook thought the problem was due to a clog in the airlift system. The clarifier effluent was slightly turbid possibly because of the low RAS flow rate.

Sludge Holding Tank: Sludge is wasted to the sludge holding tank as required. The tank is aerated periodically and decanted using a portable sump pump. Sludge is pumped as needed by a septage hauling contractor.

Chlorinator: One tube was installed in this four-tube unit. "Bridging" of the tablets in the one tube was noted. Contact tank effluent chlorine residual was 0.00 mg/l at the beginning of the inspection, below the *0.6 mg/l permit requirement. (*No more than 3 samples/month shall be less than 1.0 mg/l.)

Chlorine Contact Tank: Baffled. Effluent was slightly turbid.

Dechlorinator: Two tubes were installed in this four-tube unit.

Flow measurement: Flow is estimated based totalizer readings for the Elk Hill Farm well.

Post aeration: Aeration provided by plant blower system. Located in chamber just ahead of final effluent weir.

VA DEQ Focused CEI Tech/Lab Inspection Report

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LABORATORY INSPECTION

PRESENT DURING INSPECTION:

Michael Cook, Tamira Cohen (DEQ)

1. Do lab records include sampling date/time, analysis date/time, sample location, test method, test results, analyst's initials, instrument calibration and maintenance, and Certificate of Analysis?

- ☒ Sampling Date/Time ☒ Analysis Date/Time ☒ Sample Location ☐ Test Method ☒ Test Results
- ☒ Analyst's Initials ☒ Instrument Calibration & Maintenance
- ☒ Chain of Custody ☒ Certificate of Analysis

2. Are Discharge Monitoring Reports complete and correct?

☒ Yes ☐ No

Month(s) reviewed: July 2008

3. Are sample location(s) according to permit requirements (after all treatment unless otherwise specified)?

☒ Yes ☐ No

4. Are sample collection, preservation, and holding times appropriate; and is sampling equipment adequate?

☒ Yes ☐ No

5. Are grab and composite samples representative of the flow and the nature of the monitored activity? All samples are grab-type

☒ Yes ☐ No

6. If analysis is performed at another location, are shipping procedures adequate? List parameters and name & address of contract lab(s):

☒ Yes ☐ No

- TSS, BOD, Ammonia – EnviroCompliance Lab, Ashland, VA

7. Is Laboratory equipment in proper operating range?

☒ Yes ☐ No

8. Are annual thermometer calibration(s) adequate?

☒ Yes ☐ No

9. Is the laboratory grade water supply adequate? N/A

☐ Yes ☐ No

10. Are analytical balance(s) adequate? N/A

☐ Yes ☐ No

11. Parameters evaluated during this inspection (attach checklists):

- ☒ pH
- ☐ Temperature
- ☒ Total Residual Chlorine
- ☒ Dissolved Oxygen
- ☐ Biochemical Oxygen Demand
- ☐ Total Suspended Solids
- ☐ Other (specify) _____
- ☐ Other (specify) _____
- ☐ Other (specify) _____

Comments: See attached checklists

VA DEQ Focused CEI Tech/Lab Inspection Report

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EFFLUENT FIELD DATA: by M. Cook at time of inspection

Flow	<input type="text"/> MGD	Dissolved Oxygen	<input type="text"/> mg/L	TRC (Contact Tank)	<input type="text"/> 0.00 mg/L
pH	<input type="text"/> 7.5 S.U.	Temperature	<input type="text"/> °C	TRC (Final Effluent)	<input type="text"/> 0.08 mg/L
Was a Sampling Inspection conducted? <input type="checkbox"/> Yes (see Sampling Inspection Report) <input checked="" type="checkbox"/> No					

CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

1. Type of outfall:	<input type="checkbox"/> Shore based	<input type="checkbox"/> Submerged	Diffuser?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Are the outfall and supporting structures in good condition?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
3. Final Effluent (evidence of following problems):	<input type="checkbox"/> Sludge bar <input type="checkbox"/> Grease <input type="checkbox"/> Turbid effluent <input type="checkbox"/> Visible foam <input type="checkbox"/> Unusual color <input type="checkbox"/> Oil sheen				
4. Is there a visible effluent plume in the receiving stream?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
5. Receiving stream:	<input type="checkbox"/> No observed problems <input type="checkbox"/> Indication of problems (explain below)				
<u>Comments: Outfall could not be accessed and observed due to over-growth of vegetation.</u>					

VA DEQ Focused CEI Tech/Lab Inspection Report

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REQUIRED CORRECTIVE ACTIONS:

1. Based on the chlorine contact tank outlet residual result of 0.00 mg/l at the time of inspection, evaluation of the chlorination unit operation is required. Additional tube(s) may need to be installed in the unit or other action taken to resolve this issue. More frequent operational checks of the tubes may also be required to prevent "bridging" of the tablets in the tubes. Action taken may result in the need for the installation of additional tube(s) in the dechlorination unit.
2. The RAS flow rate was very low at the time of inspection. Repairs should be performed to the system to restore the RAS flow rate.
3. The plant outfall line and outfall could not be observed at the time of inspection due to abundant overgrowth. A path should be cleared to allow for observation of these locations.
4. Permittee must obtain and have available one of the "Methods of Analysis" indicated on the attached checklists for dissolved oxygen and total residual chlorine.
5. An initial demonstration of capability must be available for each Operator performing total residual chlorine analysis. Prepare one chlorine standard of known concentration and perform at least four replicate analyses. Document the results for each analyst. This is a one-time analysis for each Operator. Note: May not use Spec[✓]™ standards.
6. Buffering capability of the DPD pillows used for total residual chlorine analysis should be checked annually. (Pillows should adjust sample pH to between 6 and 7.)
7. A daily verification of the Pocket Colorimeter II calibration using two standards that bracket the expected result is now required. Using the Spec[✓]™ standards is acceptable. Record results.
8. Currently, operational information (equipment changes, unusual events, etc.) is recorded on daily forms. It is recommended that a dedicated log be maintained on site to record this information.
9. The single result for ammonia for July 2008 was 0.1 mg/l and was entered as such on the DMR. Please note for future reference that the QL for ammonia is 0.2 mg/l. Results less than this value should be considered as <QL for DMR purposes. A response to this item is not required.
10. Sodium thiosulfate for use with the pH test kit was not on hand at the time of inspection. Permittee must obtain sodium thiosulfate for continued use of this test kit.

NOTES and COMMENTS:

Sludge is removed from the sludge holding tank as needed by a septage hauler ("Mo Johns"). For permit renewal purposes, Ms. Cohen requested that Mr. Cook provide additional information regarding the disposal location of the sludge along with any required County approval notices.

VA DEQ Focused CEI Tech/Lab Inspection Report

ANALYST:	Michael Cook	VPDES NO	VA0062731
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Parameter: Hydrogen Ion (pH)
 Method: HACH 17-N pH Test Kit
 04/01

METHOD OF ANALYSIS:

X	MANUFACTURERS INSTRUCTIONS
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	Y	N
1) Does the facility treat domestic wastewater and have a design flow \leq to 0.040 MGD? [Permit]	X	
2) Was sample dechlorinated using sodium thiosulfate? [Notes A]		X
3) Are the vials clean and in good condition? [Permit]	X	
4) Is the color disc in good condition? [Permit]	X	
5) Are both vials used? [4]	X	
6) Are vials rinsed with sample prior to testing? [1]	X	
7) Is the proper volume of sample used? [1]	X	
8) Is the proper volume of indicator added? [2]	X	
9) Is the comparator held in front of a uniform light source or background? [5]	X	

PROBLEMS: 2) Sodium thiosulfate not on hand at time of inspection. Permittee must obtain sodium thiosulfate for continued use of this test kit.

VA DEQ Focused CEI Tech/Lab Inspection Report

ANALYST:	Michael Cook	VPDES NO.	VA0062731
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Instrument: Pocket Colorimeter II

Parameter: Total Residual Chlorine (TRC)

Method: DPD Colorimetric (HACH Pocket Colorimeter)

1/08

METHOD OF ANALYSIS: See "problems" below

HACH Manufacturer's Instructions (Method 8167) plus an edition of *Standard Methods*

	18 th Edition of <i>Standard Methods</i> 4500-Cl G
	21 st Edition of <i>Standard Methods</i> 4500-Cl G (00)

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of known TRC. Must use a lot number or source that is different from that used to prepare calibration standards. May not use Specv™. [SM 1020 B.1]		New guidance
2) Are the DPD PermaChem™ Powder Pillows stored in a cool, dry place? [Mfr.]	X	
3) Are the pillows within the manufacturer's expiration date? [Mfr.]	X	
4) Has buffering capability of DPD pillows been checked annually? (Pillows should adjust sample pH to between 6 and 7) [Mfr.]		*X
5) When pH adjustment is required, is H ₂ SO ₄ or NaOH used? [Hach 11.3.1]	*	
6) Are cells clean and in good condition? [Mfr.]	X	
7) Is the low range (0.01 mg/L resolution) used for samples containing residuals from 0.2.00 mg/L? [Mfr.]	X	
8) Is calibration curve developed (may use manufacturer's calibration) with daily verification using a high and a low standard? NOTE: May use manufacturer's installed calibration and commercially available chlorine standards for daily calibration verifications. [18 th ed 1020 B.5; 21 st ed 4020 B.2.b]		New guidance
9) Is the 10-mL cell (2.5-cm diameter) used for samples from 0-2.00 mg/L? [Mfr.]	X	
10) Is meter zeroed correctly by using sample as blank for the cell used? [Mfr.]	X	
11) Is the instrument cap placed correctly on the meter body when the meter is zeroed and when the sample is analyzed? [Mfr.]	X	
12) Is the DPD Total Chlorine PermaChem™ Powder Pillow mixed into the sample? [Hach 11.1]	X	
13) Is the analysis made at least three minutes but not more than six minutes after PermaChem™ Powder Pillow addition? [Hach 11.2]	X	
14) If read-out is flashing [2.20], is sample diluted correctly, and then reanalyzed? [Hach 1.2 & 2.0]	X	
15) Are samples analyzed within 15 minutes of collection? [40 CFR Part 136]	X	
16) Is a duplicate sample analyzed after every 20 samples if citing 18 th Edition [SM 1020 B.6] or daily for 21 st Edition [SM 4020 B.3.c]?		**
17) If duplicate sample is analyzed, is the relative percent difference (RPD) ≤ 20? [18 th ed. Table 1020 I; 21 st ed. DEQ]		**

PROBLEMS:

Permittee must have available one of the "Methods of Analysis" indicated above. (1) An initial demonstration of capability must be available for each Operator performing pH analysis. (4) Buffering capability of the DPD pillows must be checked annually. (8) Daily verification of calibration curve must be performed. ** Duplicate sample analysis is no longer required by DEQ for field instruments.

VA DEQ Focused CEI Tech/Lab Inspection Report

ANALYST:	Michael Cook	VPDES NO	VA0062731
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Meter: ___ YSI 550A

Parameter: Dissolved Oxygen
 Method: Membrane Electrode
 Facility Elevation 200'
 1/08

METHOD OF ANALYSIS: See "problems" below

<input type="checkbox"/>	18 th Edition of Standard Methods – 4500-O G
<input type="checkbox"/>	21 st or Online Editions of Standard Methods – 4500-O G (01)

DO is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]		Y	N
1)	If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [1.c]	In-situ	
2)	Are meter and electrode operable and providing consistent readings? [3]	X	
3)	Is membrane in good condition without trapped air bubbles? [3.b]	X	
4)	Is correct filling solution used in electrode? [Mfr.]	X	
5)	Are water droplets shaken off the membrane prior to calibration? [Mfr.]	X	
6)	Is meter calibrated before use or at least daily? [Mfr. & Part 1020]	X	
7)	Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	X	
8)	Is sample stirred during analysis? [Mfr.]	In-situ	
9)	Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	X	
10)	Is meter stabilized before reading D.O.? [Mfr.]	X	
11)	Is electrode stored according to manufacturer's instructions? [Mfr.]	X	
12)	Is a duplicate sample analyzed after every 20 samples if citing 18 th or 19 th Edition or daily if citing 20 th or 21 st Edition? [Part 1020] NOTE: Not required for <i>in situ</i> samples.		*
13)	If a duplicate sample is analyzed, is the reported value for that sampling event the average concentration of the sample and the duplicate? [DEQ]		*
14)	If a duplicate sample is analyzed, is the relative percent difference (RPD) ≤ 20 ? [18 th ed. Table 1020 I; 21 st ed. DEQ]		*

PROBLEMS: Permittee must have available one of the "Methods of Analysis" indicated above.

* Duplicate sample analysis is no longer required by DEQ for field instruments.

VA DEQ Focused CEI Tech/Lab Inspection Report

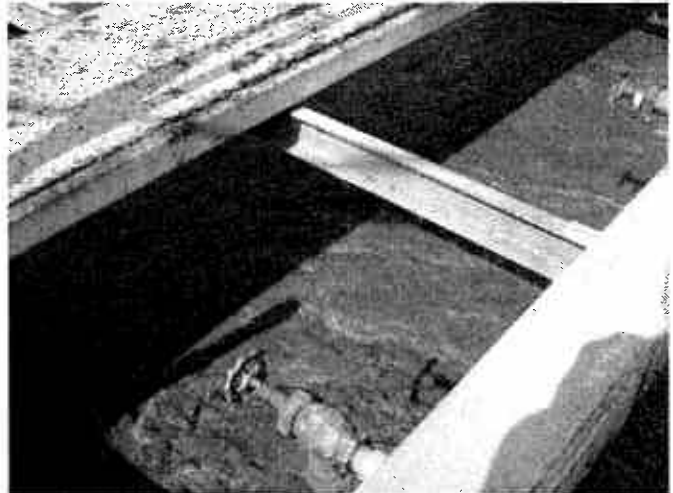
Permit #

VA0062731

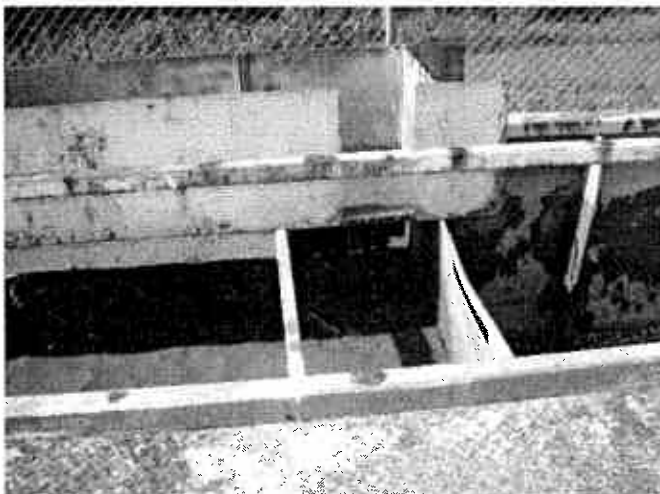
INSPECTION PHOTOS



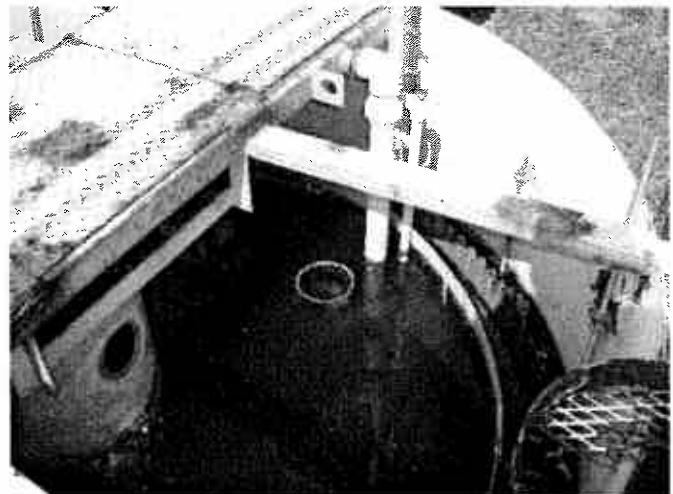
Elk Hill Farm WWTP



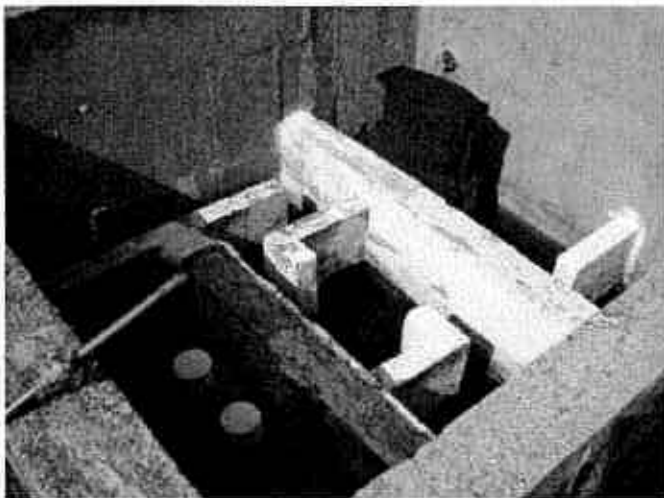
Aeration tank mixed liquor



RAS flow is just a trickle (center of photo) due to airlift system blockage



Clarifier with surface skimmer at center of photo



Chlorine contact tank. Chlorinator is in background; Dechlorinator is in foreground.



Post aeration and final effluent weir

Attachment E

Facility Effluent Data Summary and Evaluation

Attachment E

Elk Hill Farm WWTP Facility Effluent Data Summary and Evaluation

I. DMR Data:

Date	pH Min	pH Max	BOD Monthly Avg		TSS Monthly Avg		DO Min	NH ₃ Monthly Avg
	(SU)	(SU)	(mg/L)	(kg/day)	(mg/L)	(kg/day)	(mg/L)	(mg/L)
10-Sep-05	7.5	7.8	<2	0.04	4.4	0.08	7	-
10-Oct-05	7.5	7.5	<QL	<QL	13.2	0.3	6.9	-
10-Nov-05	7.5	7.5	13.3	0.25	<2	0.038	7.5	-
10-Dec-05	7.5	7.5	2	0.04	40.7	0.78	7.5	-
10-Jan-06	7.5	7.5	32	0.61	29	0.54	7.5	-
10-Feb-06	7.5	7.5	7	0.14	17.1	0.32	7.5	-
10-Mar-06	7.5	7.5	12	0.23	18.4	0.35	7.5	-
10-Apr-06	7.5	7.5	6	0.14	6.7	0.15	7.5	-
10-May-06	7.5	7.5	4	0.05	17.4	0.2	7.5	-
10-Jun-06	7.5	7.5	<2	0.02	5.8	0.07	7.7	-
10-Jul-06	7.5	7.5	4	0.06	6.3	0.1	7.2	-
10-Aug-06	7.5	7.5	2	0.03	2.5	0.04	7.4	-
10-Sep-06	7.5	7.5	2	0.02	8.5	0.06	7	-
10-Oct-06	7.5	7.5	5	0.04	2.5	0.02	7.6	-
10-Nov-06	7.5	7.5	3	0.091	4.5	0.136	7.7	-
10-Dec-06	7.5	7.5	4	0.05	4.6	0.05	7.7	-
10-Jan-07	7.5	7.5	<2	0.03	14.6	0.27	7.6	-
10-Feb-07	7.5	7.5	14	0.11	23.3	0.18	7.2	-
10-Mar-07	7.5	7.8	35	0.8	10.1	0.23	7.5	-
10-Apr-07	7.5	7.5	2	0.03	3.8	0.06	7.8	-
10-May-07	7.5	7.5	2	0.04	3.9	0.07	7.6	-
10-Jun-07	7.5	7.5	22	0.3	1.1	0.02	7.8	-
10-Jul-07	7.5	7.5	2	0.04	1	0.02	7	-
10-Aug-07	7.5	7.5	13	0.3	2.8	0.06	7.8	-
10-Sep-07	7.5	7.5	<QL	<QL	1.9	0.04	7.6	-
10-Oct-07	7.5	7.5	2	0.03	2.2	0.03	7.5	-
10-Nov-07	7.5	7.5	<QL	<QL	1.9	0.03	7.5	-
10-Dec-07	7.5	7.5	6	0.1	2	0.04	7.4	-
10-Jan-08	7.5	7.5	4	0.08	5.2	0.1	7.4	-
10-Feb-08	7.5	7.5	5	0.1	5.6	0.2	7.8	0.2
10-Mar-08	7.5	7.5	<QL	<QL	3.5	0.05	7.6	<QL
10-Apr-08	7.5	7.5	<QL	<QL	2.7	0.05	7.5	<QL
10-May-08	7.5	7.5	<QL	<QL	2	0.1	7.8	0.3
10-Jun-08	7.5	7.5	4	0.2	4.7	0.2	7.1	<QL
10-Jul-08	7.5	7.5	<QL	<QL	4.3	0.08	7.8	0.10
10-Aug-08	7.5	7.5	<QL	<QL	5	0.08	7.8	0.10
90th percentile	7.5	7.5	18.8	0.3	18	0.31	7.8	-
10th percentile	7.5	7.5	2	0.03	1.94	0.03	7.05	-
Maximum	7.5	7.8	35	0.8	40.7	0.78	7.8	-
Minimum	7.5	7.5	2	0.02	1	0.02	6.9	-
Average	7.5	7.5	8.3	0.1	8.1	0.1	7.5	-

II. STATS.exe Output: Facility = Elk Hil Farm WWTP

<p>Chemical = TRC Chronic averaging period = 4 WLAa = 0.019 mg/L WLAc = 0.011 mg/L Q.L. = 0.10 mg/L # samples/mo. = 30 # samples/wk. = 7</p> <p>Summary of Statistics: # observations = 1 Expected Value = 20 Variance = 144 C.V. = 0.6 97th percentile daily values = 48.6683 97th percentile 4 day average = 33.2758 97th percentile 30 day average= 24.1210 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Average Weekly limit = 0.009.8252545713861 mg/L Average Monthly Limit = 0.0079737131838758 mg/L</p> <p>The data are: 20 mg/L</p>	<p>Chemical = Ammonia Chronic averaging period = 30 WLAa = 19.9 mg/L WLAc = 1.83 mg/L Q.L. = 0.20 mg/L # samples/mo. = 1 # samples/wk. = 1</p> <p>Summary of Statistics: # observations = 1 Expected Value = 9 Variance = 29.16 C.V. = 0.6 97th percentile daily values = 21.9007 97th percentile 4 day average = 14.9741 97th percentile 30 day average= 10.8544 # < Q.L. = 0 Model used = BPJ Assumptions, type 2 data</p> <p>A limit is needed based on Chronic Toxicity Average Weekly limit = 3.69233627095185 mg/L Average Monthly Limit = 3.69233627095185 mg/L</p> <p>The data are: 9.00 mg/L</p>
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Attachment F

MSTRANTI Printout and MSTRANTI Data Source Report

MSTRANTI DATA SOURCE REPORT

Stream information	
Mean Hardness	Conservative default assumption
90% Temperature (annual)	Effluent data used from application (additional temperatures provided in email dated 12/12/2008) given the intermittent nature of the stream. Maximum temperature used as a conservative measure.
90% Temperature (wet season)	Effluent data used from application (additional temperatures provided in email dated 12/12/2008) given the intermittent nature of the stream. Maximum temperature used as a conservative measure.
90% Maximum pH	Effluent data used from DMRs given the intermittent nature of the stream
10% Maximum pH	Effluent data used from DMRs given the intermittent nature of the stream
Tier Designation	Tier Determination (Item 14 in Fact Sheet)
Stream Flows	
All Data	See flow frequencies (Item 5 in Fact Sheet)
Mixing Information	
All Data	Not Applicable
Effluent Information	
Mean Hardness	Conservative default assumption
90% Temperature	Same as above.
90% Maximum pH	Same as above.
10% Maximum pH	Same as above.
Discharge flow	Design flow obtained from permit application

Data Location:

Flow Frequency Description – Attachment A
 Effluent Data – Attachment E

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Elk Hill Farm

Permit No.: VA0062731

Receiving Stream: UT to Little River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Parameter (ug/l, unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute		Chronic		HH (PWS)		HH		Acute		Chronic		HH (PWS)		HH		Acute		Chronic	
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	na	2.7E+03	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	--	2.7E+03
Acrolein	0	--	--	na	7.8E+02	--	--	na	7.8E+02	--	--	--	--	--	--	--	--	--	--	--	7.8E+02
Acrylonitrile ^C	0	--	--	na	6.6E+00	--	--	na	6.6E+00	--	--	--	--	--	--	--	--	--	--	--	6.6E+00
Aldrin ^C	0	3.0E+00	--	na	1.4E-03	3.0E+00	--	na	1.4E-03	--	--	--	--	--	--	--	--	3.0E+00	--	na	1.4E-03
Ammonia-N (mg/l) (Yearly)	0	1.99E+01	1.83E+00	na	--	2.0E+01	1.8E+00	na	--	--	--	--	--	--	--	--	--	2.0E+01	1.8E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	1.99E+01	3.49E+00	na	--	2.0E+01	3.5E+00	na	--	--	--	--	--	--	--	--	--	2.0E+01	3.5E+00	na	--
Anthracene	0	--	--	na	1.1E+05	--	--	na	1.1E+05	--	--	--	--	--	--	--	--	--	--	na	1.1E+05
Animony	0	--	--	na	4.3E+03	--	--	na	4.3E+03	--	--	--	--	--	--	--	--	--	--	na	4.3E+03
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Bamun	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene ^C	0	--	--	na	7.1E+02	--	--	na	7.1E+02	--	--	--	--	--	--	--	--	--	--	na	7.1E+02
Benzidine ^C	0	--	--	na	5.4E-03	--	--	na	5.4E-03	--	--	--	--	--	--	--	--	--	--	na	5.4E-03
Benzo (a) anthracene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Benzo (b) fluoranthene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Benzo (k) fluoranthene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Benzo (a) pyrene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Bis(2-Chloroethyl) Ether	0	--	--	na	1.4E+01	--	--	na	1.4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Bis(2-Chloroisopropyl) Ether	0	--	--	na	1.7E+05	--	--	na	1.7E+05	--	--	--	--	--	--	--	--	--	--	na	1.7E+05
Bromolom ^C	0	--	--	na	3.6E+03	--	--	na	3.6E+03	--	--	--	--	--	--	--	--	--	--	na	3.6E+03
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	5.2E+03	--	--	--	--	--	--	--	--	--	--	na	5.2E+03
Cadmium	0	8.2E-01	3.8E-01	na	--	8.2E-01	3.8E-01	na	--	--	--	--	--	--	--	--	--	6.2E-01	3.6E-01	na	--
Carbon Tetrachloride ^C	0	--	--	na	4.4E+01	--	--	na	4.4E+01	--	--	--	--	--	--	--	--	--	--	na	4.4E+01
Chlordane ^C	0	2.4E+00	4.3E-03	na	2.2E-02	2.4E+00	4.3E-03	na	2.2E-02	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	2.2E-02
Chlordane ^C	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
Chloride	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
TRC	0	--	--	na	2.1E+04	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	--	--	na	2.1E+04
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	--	--	na	2.1E+04

Stream Flows		Mixing Information		Effluent Information	
1Q10 (Annual) =	0 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	25 mg/L
7Q10 (Annual) =	0 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	28 deg C
3Q10 (Annual) =	0 MGD	- 3Q10 Mix =	100 %	90% Temp (Wet season) =	18 deg C
1Q10 (Wet season) =	0 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.5 SU
3Q10 (Wet season) =	0 MGD	- 3Q10 Mix =	100 %	10% Maximum pH =	7.5 SU
3Q05 =	0 MGD			Discharge Flow =	0.0125 MGD
Harmonic Mean =	0 MGD				
Annual Average =	MGD				

Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorobromomethane ^C	0	--	--	na	3.4E+02	--	--	na	3.4E+02	--	--	--	--	--	--	--	--	--	--	na	3.4E+02
Chloroform ^C	0	--	--	na	2.9E+04	--	--	na	2.9E+04	--	--	--	--	--	--	--	--	--	--	na	2.9E+04
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	4.3E+03	--	--	--	--	--	--	--	--	--	--	na	4.3E+03
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	4.0E+02	--	--	--	--	--	--	--	--	--	--	na	4.0E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	na	--
Chromium III	0	1.8E+02	2.4E+01	na	--	1.8E+02	2.4E+01	na	--	--	--	--	--	--	--	--	--	1.8E+02	2.4E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	na	--
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Copper	0	3.6E+00	2.7E+00	na	--	3.6E+00	2.7E+00	na	--	--	--	--	--	--	--	--	--	3.6E+00	2.7E+00	na	--
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.2E+01	5.2E+00	na	2.2E+05	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	na	2.2E+05
DDD ^C	0	--	--	na	8.4E-03	--	--	na	8.4E-03	--	--	--	--	--	--	--	--	--	--	na	8.4E-03
DDE ^C	0	--	--	na	5.9E-03	--	--	na	5.9E-03	--	--	--	--	--	--	--	--	--	--	na	5.9E-03
DDT ^C	0	1.1E+00	1.0E-03	na	5.9E-03	1.1E+00	1.0E-03	na	5.9E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	na	5.9E-03
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Dibenz(a,h)anthracene ^C	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Diethyl phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
Dichloromethane	0	--	--	na	1.6E+04	--	--	na	1.6E+04	--	--	--	--	--	--	--	--	--	--	na	1.6E+04
(Methylene Chloride) ^C	0	--	--	na	1.7E+04	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04
1,2-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.6E+03	--	--	--	--	--	--	--	--	--	--	na	2.6E+03
1,3-Dichlorobenzene	0	--	--	na	2.6E+03	--	--	na	2.6E+03	--	--	--	--	--	--	--	--	--	--	na	2.6E+03
1,4-Dichlorobenzene	0	--	--	na	7.7E-01	--	--	na	7.7E-01	--	--	--	--	--	--	--	--	--	--	na	7.7E-01
3,3-Dichlorobenzidine ^C	0	--	--	na	4.6E+02	--	--	na	4.6E+02	--	--	--	--	--	--	--	--	--	--	na	4.6E+02
Dichlorobromomethane ^C	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
1,2-Dichloroethane ^C	0	--	--	na	1.7E+04	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04
1,1-Dichloroethylene	0	--	--	na	1.4E+05	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	--	--	na	1.4E+05
1,2-trans-dichloroethylene	0	--	--	na	7.9E+02	--	--	na	7.9E+02	--	--	--	--	--	--	--	--	--	--	na	7.9E+02
2,4-Dichlorophenol	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
2,4-Dichlorophenoxy	0	--	--	na	3.9E+02	--	--	na	3.9E+02	--	--	--	--	--	--	--	--	--	--	na	3.9E+02
acetic acid (2,4-D)	0	--	--	na	1.7E+03	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
1,2-Dichloropropane ^C	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	na	1.4E+03
1,3-Dichloropropene	0	2.4E-01	5.6E-02	na	1.2E+05	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	--	--	na	1.2E+05
Dieldrin ^C	0	--	--	na	5.9E+01	--	--	na	5.9E+01	--	--	--	--	--	--	--	--	--	--	na	5.9E+01
Diethyl Phthalate	0	--	--	na	2.3E+03	--	--	na	2.3E+03	--	--	--	--	--	--	--	--	--	--	na	2.3E+03
Di-2-Ethylhexyl Phthalate ^C	0	--	--	na	2.9E+06	--	--	na	2.9E+06	--	--	--	--	--	--	--	--	--	--	na	2.9E+06
2,4-Dimethylphenol	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
Dimethyl Phthalate	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Di-n-Butyl Phthalate	0	--	--	na	7.6E+02	--	--	na	7.6E+02	--	--	--	--	--	--	--	--	--	--	na	7.6E+02
2,4-Dinitrophenol	0	--	--	na	9.1E+01	--	--	na	9.1E+01	--	--	--	--	--	--	--	--	--	--	na	9.1E+01
2-Methyl-4,6-Dinitrophenol	0	--	--	na	1.2E+06	--	--	na	1.2E+06	--	--	--	--	--	--	--	--	--	--	na	1.2E+06
2,4-Dinitrotoluene ^C	0	--	--	na	5.4E+00	--	--	na	5.4E+00	--	--	--	--	--	--	--	--	--	--	na	5.4E+00
2,4,6-Trinitrophenol (2,4,6-Trinitrophenol)	0	--	--	na	2.2E-01	2.2E-01	5.6E-02	na	2.4E+02	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	na	2.4E+02
Endosulfan Sulfate	0	--	--	na	2.4E+02	--	--	na	2.4E+02	--	--	--	--	--	--	--	--	--	--	na	2.4E+02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	8.6E-02	3.6E-02	na	8.1E-01	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	na	8.1E-01
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	8.1E-01	--	--	--	--	--	--	--	--	--	--	na	8.1E-01
Ethylbenzene	0	--	--	na	2.9E+04	--	--	na	2.9E+04	--	--	--	--	--	--	--	--	--	--	na	2.9E+04
Fluoranthene	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+02
Fluorene	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor ^c	0	5.2E-01	3.8E-03	na	2.1E-03	5.2E-01	3.8E-03	na	2.1E-03	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	2.1E-03
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	na	1.1E-03	5.2E-01	3.8E-03	na	1.1E-03	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	1.1E-03
Hexachlorobenzene ^c	0	--	--	na	7.7E-03	--	--	na	7.7E-03	--	--	--	--	--	--	--	--	--	--	na	7.7E-03
Hexachlorocyclopentadiene ^c	0	--	--	na	5.0E+02	--	--	na	5.0E+02	--	--	--	--	--	--	--	--	--	--	na	5.0E+02
Hexachlorocyclohexane	0	--	--	na	1.3E-01	--	--	na	1.3E-01	--	--	--	--	--	--	--	--	--	--	na	1.3E-01
Alpha-BHC ^c	0	--	--	na	4.6E-01	--	--	na	4.6E-01	--	--	--	--	--	--	--	--	--	--	na	4.6E-01
Beta-BHC ^c	0	--	--	na	6.3E-01	--	--	na	6.3E-01	--	--	--	--	--	--	--	--	9.5E-01	--	na	6.3E-01
Gamma-BHC ^c (Lindane)	0	9.5E-01	na	na	6.3E-01	9.5E-01	--	na	6.3E-01	--	--	--	--	--	--	--	--	--	--	na	6.3E-01
Hexachlorocyclopentadiene	0	--	--	na	1.7E+04	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04
Hexachloroethane ^c	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene ^c	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	--	--	--	na	4.9E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone ^c	0	--	--	na	2.6E+04	--	--	na	2.6E+04	--	--	--	--	--	--	--	--	--	--	na	2.6E+04
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	2.0E+01	2.3E+00	na	--	2.0E+01	2.3E+00	na	--	--	--	--	--	--	--	--	--	2.0E+01	2.3E+00	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.4E+00	7.7E-01	na	5.1E-02	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	na	5.1E-02
Methyl Bromide	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Monochlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	--	--	na	2.1E+04
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	5.6E+01	6.3E+00	na	4.6E+03	--	--	--	--	--	--	--	--	5.6E+01	6.3E+00	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
N-Nitrosodimethylamine ^c	0	--	--	na	8.1E+01	--	--	na	8.1E+01	--	--	--	--	--	--	--	--	--	--	na	8.1E+01
N-Nitrosodiphenylamine ^c	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	--	--	na	1.6E+02
N-Nitrosodi-n-propylamine ^c	0	--	--	na	1.4E+01	--	--	na	1.4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB-1016	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1221	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1232	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1242	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1248	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1254	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB-1260	0	--	1.4E-02	na	--	--	1.4E-02	na	--	--	--	--	--	--	--	--	--	--	1.4E-02	na	--
PCB Total ^c	0	--	--	na	1.7E-03	--	--	na	1.7E-03	--	--	--	--	--	--	--	--	--	--	na	1.7E-03

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Pentachlorophenol ^C	0	1.4E+01	1.1E+01	na	8.2E+01	1.4E+01	1.1E+01	na	8.2E+01	--	--	--	--	--	--	--	--	1.4E+01	1.1E+01	na	8.2E+01
Phenol	0	--	--	na	4.6E+06	--	--	na	4.6E+06	--	--	--	--	--	--	--	--	--	--	na	4.6E+06
Pyrene	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Radionuclides (pCi/l except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity	0	--	--	na	1.5E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	--	--	--	na	1.5E+01
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00
Sr-90	0	--	--	na	8.0E+00	--	--	na	8.0E+00	--	--	--	--	--	--	--	--	--	--	na	8.0E+00
Tritium	0	--	--	na	2.0E+04	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.0E+01	5.0E+00	na	1.1E+04	--	--	--	--	--	--	--	--	2.0E+01	5.0E+00	na	1.1E+04
Silver	0	3.2E-01	--	na	--	3.2E-01	--	na	--	--	--	--	--	--	--	--	--	3.2E-01	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,1,2,2-Tetrachloroethane ^C	0	--	--	na	1.1E+02	--	--	na	1.1E+02	--	--	--	--	--	--	--	--	--	--	na	1.1E+02
Tetrachloroethylene ^C	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	8.9E+01
Thallium	0	--	--	na	6.3E+00	--	--	na	6.3E+00	--	--	--	--	--	--	--	--	--	--	na	6.3E+00
Toluene	0	--	--	na	2.0E+05	--	--	na	2.0E+05	--	--	--	--	--	--	--	--	--	--	na	2.0E+05
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Toxaphene ^C	0	7.3E-01	2.0E-04	na	7.5E-03	7.3E-01	2.0E-04	na	7.5E-03	--	--	--	--	--	--	--	--	7.3E-01	2.0E-04	na	7.5E-03
Tributyltin	0	4.6E-01	6.3E-02	na	--	4.6E-01	6.3E-02	na	--	--	--	--	--	--	--	--	--	4.6E-01	6.3E-02	na	--
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	9.4E+02	--	--	--	--	--	--	--	--	--	--	na	9.4E+02
1,1,2-Trichloroethane ^C	0	--	--	na	4.2E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	--	--	--	na	4.2E+02
Trichloroethylene ^C	0	--	--	na	8.1E+02	--	--	na	8.1E+02	--	--	--	--	--	--	--	--	--	--	na	8.1E+02
2,4,6-Trichlorophenol ^C	0	--	--	na	6.5E+01	--	--	na	6.5E+01	--	--	--	--	--	--	--	--	--	--	na	6.5E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Vinyl Chloride ^C	0	--	--	na	6.1E+01	--	--	na	6.1E+01	--	--	--	--	--	--	--	--	--	--	na	6.1E+01
Zinc	0	3.6E+01	3.6E+01	na	6.9E+04	3.6E+01	3.6E+01	na	6.9E+04	--	--	--	--	--	--	--	--	3.6E+01	3.6E+01	na	6.9E+04

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipalities
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
Antidegradation WLAs are based upon a complete mix.
Antidegradation Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens, Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)
Antimony	4.3E+03
Arsenic	9.0E+01
Barium	na
Cadmium	2.3E-01
Chromium III	1.4E+01
Chromium VI	6.4E+00
Copper	1.5E+00
Iron	na
Lead	1.4E+00
Manganese	na
Mercury	5.1E-02
Nickel	3.8E+00
Selenium	3.0E+00
Silver	1.3E-01
Zinc	1.4E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Attachment G

**Excerpt from 2003 Permit Reissuance Fact Sheet (Ammonia
Limit Development)**

Ammonia-N Waste Load Allocation

Facility	Elk Hill Farm	Enter facility info here			
Permit No	VA0062731				
Effluent pH	8.0				
Effluent temperature	27	MIN	1.27	2.85	1.27
Effluent Flow	0.0125	MAX	1.27		
Stream flow	1Q10 30Q10	0			
		0			
Acute Mix	100				
Chronic Mix	100				
Ammonia Acute Criteria		WLAa			
Without Trout	8.41	8.41			
With Trout	5.62	5.62			
Ammonia Chronic Criteria		WLAc			
Without Fish	1.09	1.09			
With fish	1.09	1.09			

Use this data to calculate NH3 limits

Note:

Acute without trout equation	=	$0.411 / (1 + 10^{(7.204 - \text{pH})}) + 58.4 / (1 + 10^{(\text{pH} - 7.204)})$
Acute with trout equation	=	$0.275 / (1 + 10^{(7.204 - \text{pH})}) + 39.0 / (1 + 10^{(\text{pH} - 7.204)})$
Chronic without fish	=	$[0.0577 / (1 + 10^{(7.688 - \text{pH})}) + 2.487 / (1 + 10^{(\text{pH} - 7.688)})] \times \text{MAX}$
Chronic with fish	=	$[0.0577 / (1 + 10^{(7.688 - \text{pH})}) + 2.487 / (1 + 10^{(\text{pH} - 7.688)})] \times \text{MIN}$
where MIN = the lesser of 2.85 or $1.45 \cdot 10^{(0.028 \cdot (25 - T))}$		
and MAX = $1.45 \cdot 10^{(0.028 \cdot (25 - T))}$		

8/1/03 9:55:54 AM

Facility = VA0062731
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 8.4
WLAc = 1.09
Q.L. = 0.2
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 2.19926040182378
Average Weekly limit = 2.19926040182378
Average Monthly Limit = 2.19926040182378

The data are:

9

The value 9 was used to force the program to calculate a limit per guidance memo #01-2011.

Attachment H

Stream Sanitation Analysis

MEMORANDUM

State Water Control Board

100 North Main Street

P. O. Box 11143

Baldwin, CA 94002

SUBJECT: Elk Hill Farms, Inc., Goochland County

TO: ~~File~~ G. H. Whitaker

FROM: C. T. Bathala

DATE: April 18, 1977

COPIES: BAT, File

STREAM SANITATION ANALYSIS

PROPOSED DISCHARGE

Process:

Hydraulic Load	0.0125	MGD	
Raw Sewage BOD ₅		mg/l;	lbs/day
Degree of Treatment		%	
Final Effluent BOD ₅		mg/l;	lbs/day

RECEIVING STREAM

Name: Little River

Basin: James

Sub-Basin: Middle James

2-10

Stream Uses (Subclass A): Waters generally satisfactory for use as public or municipal water supply, secondary contact recreation, propagation of fish and aquatic life, and other beneficial uses.

III-A

Coliform Organisms - Fecal coliforms (multiple-tube fermentation or MF count) not to exceed a log mean of 1000/100 ml. No to equal or exceed 2000/100 mg. in more than 10% of samples.

Monthly average value not more than 5000/100 ml. (MPN or MF count). Not more than 5000 MPN/100 ml. in more than 20% of samples in any month. Not more than 20,000/100 ml. in more than 5% of such samples.

Stream Standards:

Minimum D.O. 4.0 mg/l

pH Range 6.0-8.5

Temperature Max. 90°F

5°F rise above natural

Daily Average 5.0 mg/l

Page 2

Comments:

1. BOD₅ - 30 mg/l
2. Suspended Solids - 30 mg/l
3. D.O. - 5.5 mg/l
4. Flow - 12,500 gpd

Non-degradation policy of the Law (memo dated September 9, 1971, from LGL) was applied.

If the plant meets the above requirements, the water quality standards will be maintained.

sw